

FIG. 1

COMPLETE FEATURE SET FOR IMAGE X
↓
COMPARISON RULE FOR CATEGORY c_i
(i.e. FEATURE COMBINATION DESCRIBING
CATEGORY c_i)

FROM THE COMPLETE SET OF FEATURES FOR THE
IMAGE X, TAKE ONLY THE FEATURES REQUIRED BY
THE COMPARISON RULE FOR THE CATEGORY c_i

COMPUTE THE SIMILARITY METRIC, $\text{sim}(x, c_i)$ BETWEEN THE IMAGE X,
AND CATEGORY c_i AS:

$$\text{sim}(x, c_i) = \frac{1}{N_i} \prod_{j=1}^{M_i} \tau(\text{RF}_j(x|c_i), \text{RF}_j(c_i)) \cdot \sum_{j=1}^{N_i} \tau(\text{FO}_j(x|c_i), \text{FO}_j(c_i))$$

$$\tau(a, B) = \begin{cases} 1, & (\exists i) \ a = b_i \\ 0, & (\forall i) \ a \neq b_i \end{cases} \quad \text{AND} \quad B = \{b_i\}_{i=1, \dots, I}$$

WHERE: RF ARE M_i REQUIRED FEATURES, AND FO ARE N_i
FREQUENTLY OCCURRING FEATURES FOR THE CATEGORY c_i

$\text{sim}(x, c_i)$

FIG.2

B

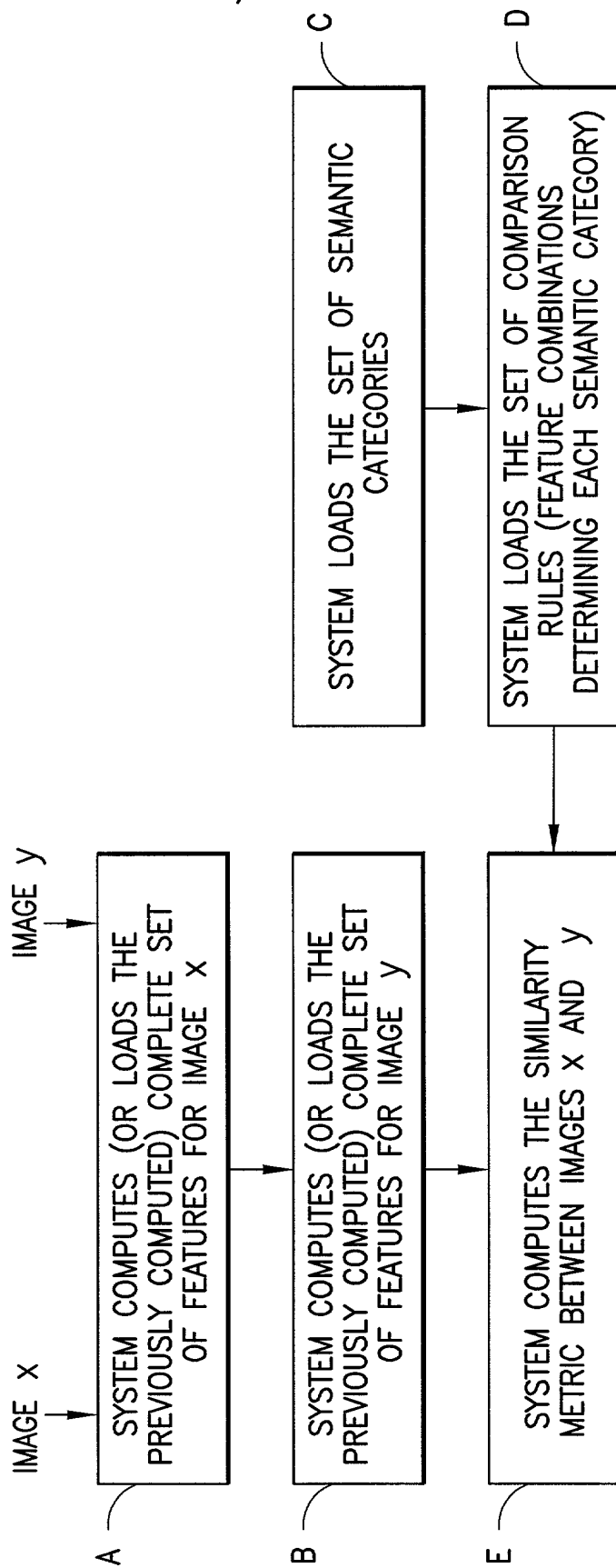
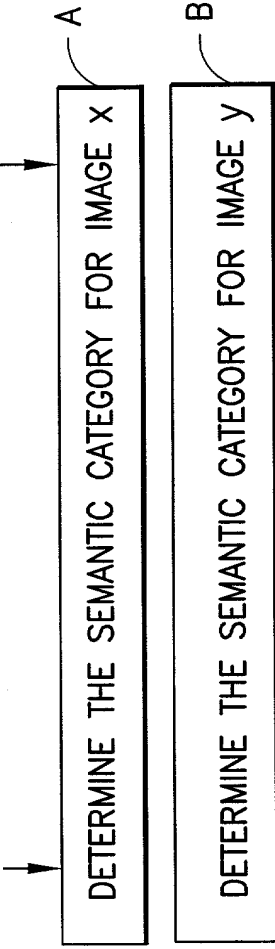


FIG.3

COMPLETE FEATURE SET FOR IMAGE X COMPLETE FEATURE SET FOR IMAGE Y



COMPUTE THE SIMILARITY METRIC $\text{sim}(x, y)$ BETWEEN THE IMAGES x AND y AS:

$$\text{sim}(x, y) = [\text{sim}(x, y|cx) + \text{sim}(x, y|cy)] / 2$$

WHERE:

$$\text{sim}(x, y|cx) = \frac{\prod_{i=1}^{M_x} (1 + \tau(RF_i(x|cx), RF_i(y|cx))) \cdot \prod_{j=1}^{N_y} (1 + \tau(FO_j(x|cx), FO_j(y|cy)))}{2^{M_x} + 2^{N_y}}$$

$$\text{sim}(x, y|cy) = \frac{\prod_{i=1}^{M_y} (1 + \tau(RF_i(x|cy), RF_i(y|cy))) \cdot \prod_{j=1}^{N_x} (1 + \tau(FO_j(x|cy), FO_j(y|cy)))}{2^{M_y} + 2^{N_x}}$$

$$\tau(a, B) = \begin{cases} 1, & (\exists i) \ a = b_i \\ 0, & (\forall i) \ a \neq b_i \end{cases} \quad \text{AND} \quad B = \{b_i\}_{i=1, \dots, I}$$

$\text{sim}(x, y)$

FIG. 4

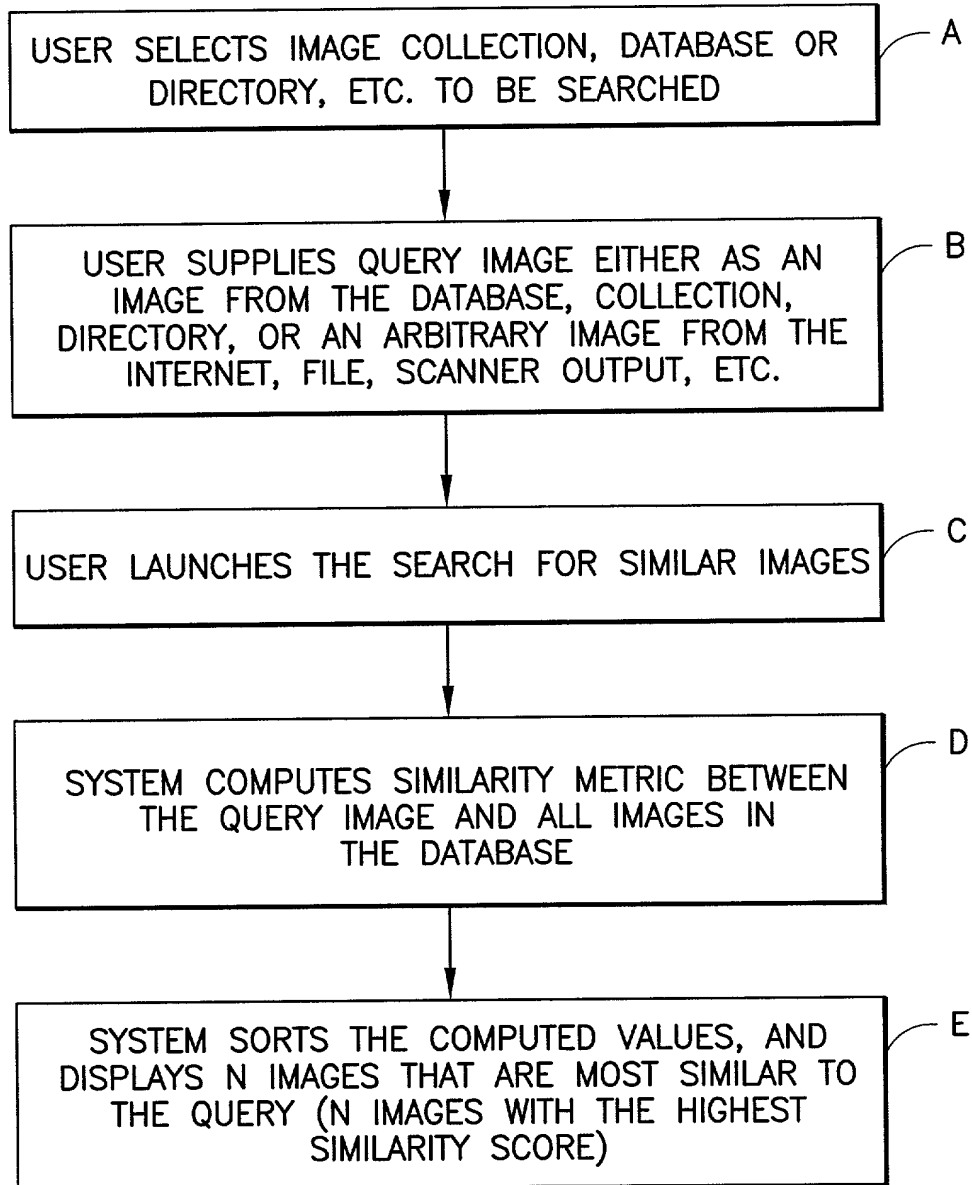


FIG.5

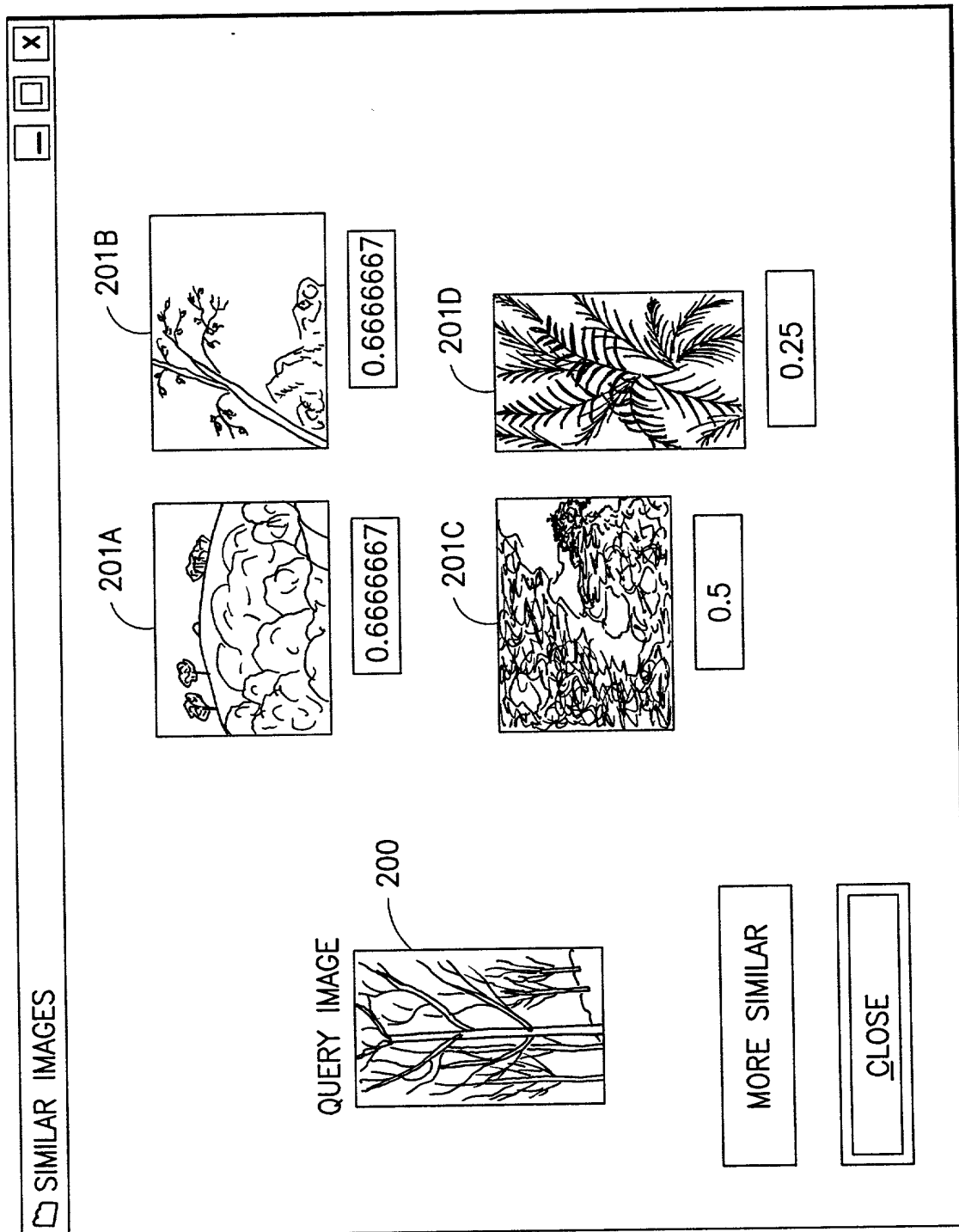


FIG.6

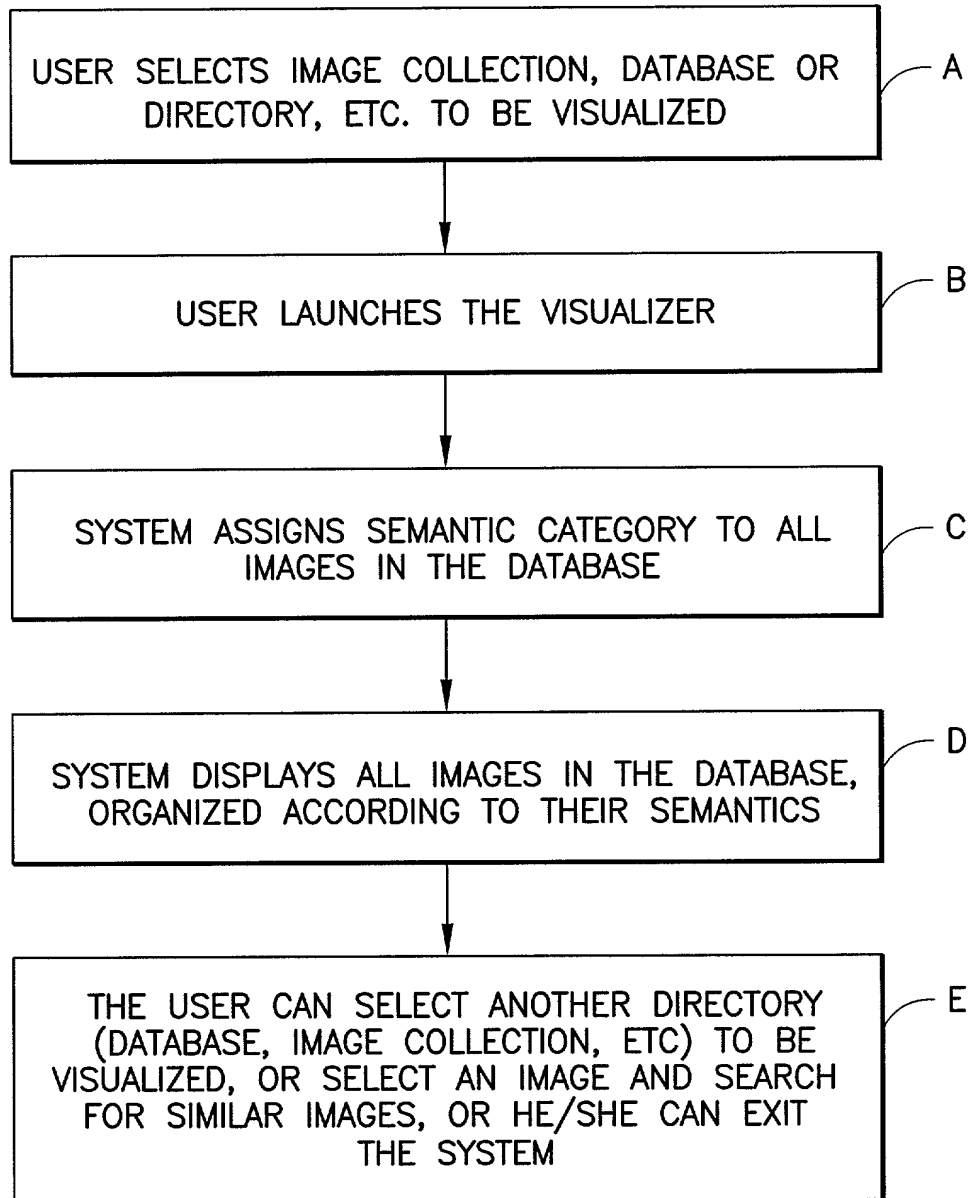


FIG.7

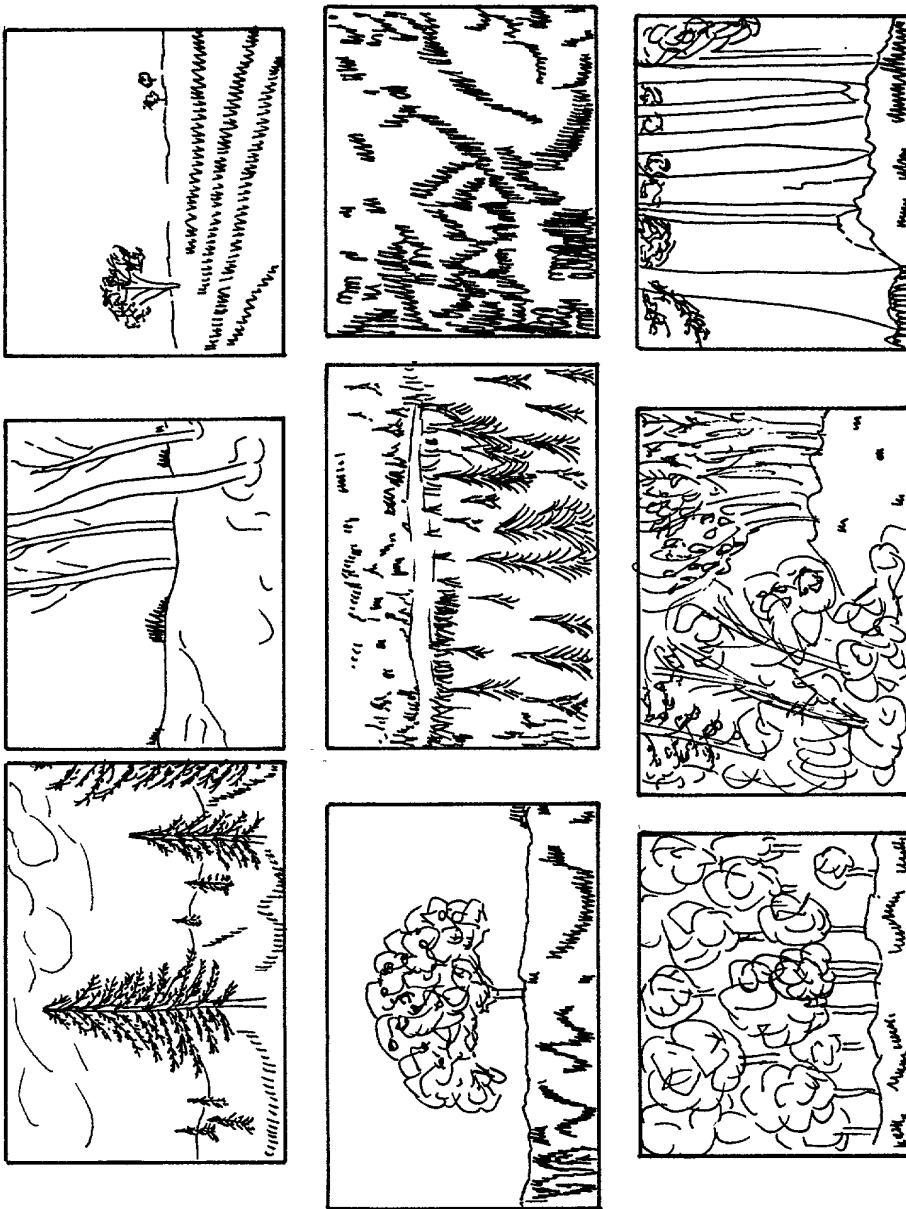


FIG. 8

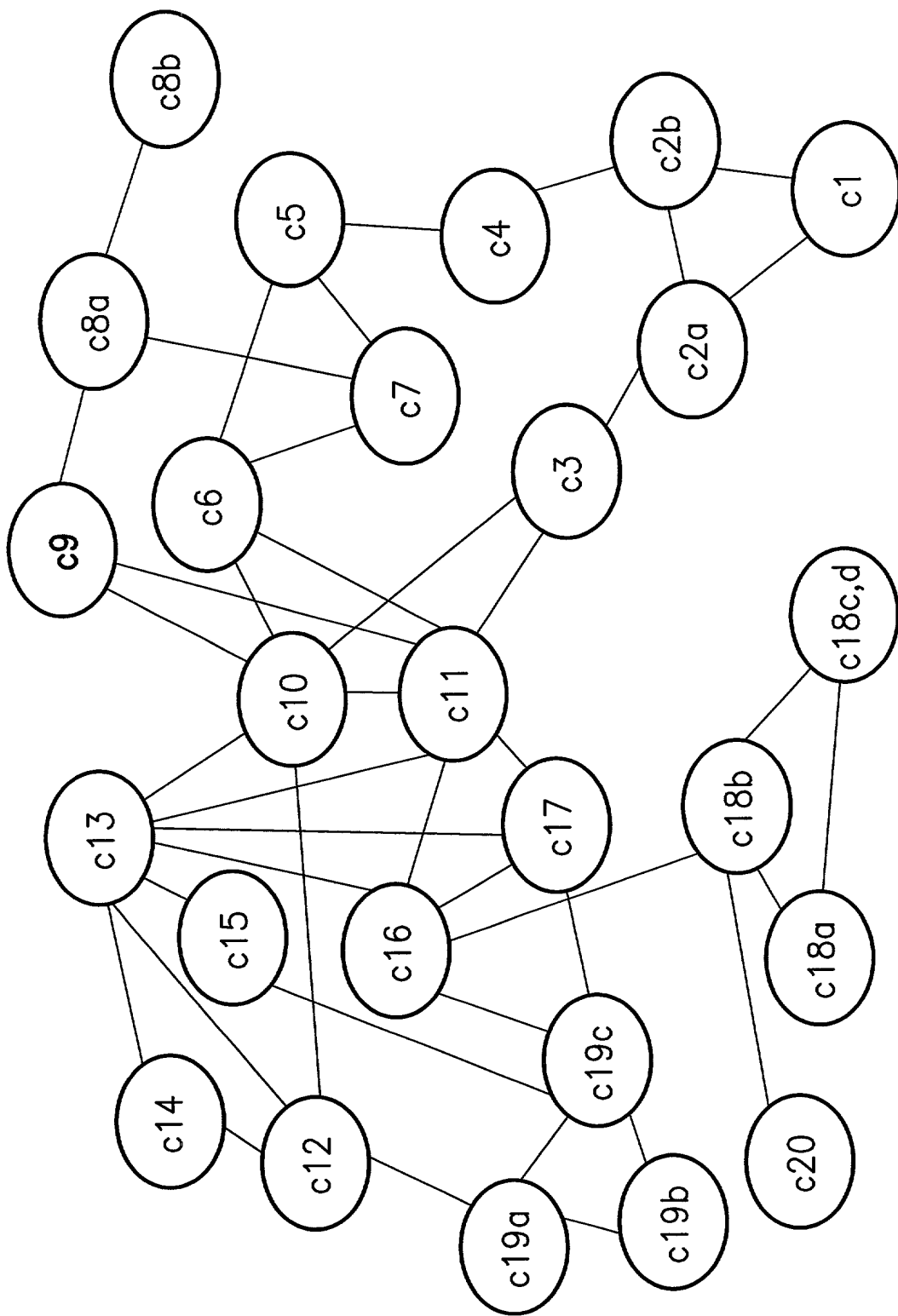


FIG.9